CLAIMS:

1. An image processing method comprising the steps of:

with each pixel constituting an image defined as a pixel of interest, determining a variance of pixel values in a local region to which said pixel of interest belongs; and

maintaining the pixel value of said pixel of interest when said determined variance is significantly larger than a variance of noise, otherwise suppressing the pixel value of said pixel of interest.

2. An image processing method comprising the steps of:

with each pixel constituting multi-slice images defined as a pixel of interest, determining a variance of pixel values in a local region to which said pixel of interest belongs;

performing pixel value adjustment involving maintaining the pixel value of said pixel of interest when said determined variance is significantly larger than a variance of noise, otherwise suppressing the pixel value of said pixel of interest; and

performing maximum intensity projection on the multi-slice images subjected to said pixel value adjustment.

3. An image processing method comprising the steps of:

with each pixel constituting multi-slice images defined as a pixel of interest, determining a variance of pixel values in a local region to which said pixel of interest belongs;

adding to said determined variance a variance of pixel values in a local region to which a corresponding pixel of interest in an image of a neighboring slice belongs;

performing pixel value adjustment involving maintaining the pixel value of said pixel of interest when said added variance is significantly larger than a variance of noise, otherwise suppressing the pixel value of said pixel of interest; and

performing maximum intensity projection on the multi-slice images subjected to said pixel value adjustment.

4.   The image processing method according to any one of claims 1 —
3, wherein said suppression of the pixel value is performed by multiplying by
a coefficient less than one.

5

5.   The image processing method according to any one of claims 1 —
3, wherein said suppression of the pixel value is performed by subtracting a
predefined numeric value.

10   6.   An image processing method comprising the steps of:
with each pixel constituting an image defined as a pixel of interest,
determining a variance of pixel values in a local region to which said pixel of
interest belongs; and
enhancing the pixel value of said pixel of interest when said
15   determined variance is significantly larger than a variance of noise,
otherwise maintaining the pixel value of said pixel of interest.

7.   An image processing method comprising the steps of:
with each pixel constituting multi-slice images defined as a pixel
20   of interest, determining a variance of pixel values in a local region to which
said pixel of interest belongs;
performing pixel value adjustment involving enhancing the pixel
value of said pixel of interest when said determined variance is significantly
larger than a variance of noise, otherwise maintaining the pixel value of said
25   pixel of interest; and
performing maximum intensity projection on the multi-slice
images subjected to said pixel value adjustment.

8.   An image processing method comprising the steps of:
30   with each pixel constituting multi-slice images defined as a pixel
of interest, determining a variance of pixel values in a local region to which
said pixel of interest belongs;
adding to said determined variance a variance of pixel values in a
local region to which a corresponding pixel of interest in an image of a

neighboring slice belongs;

performing pixel value adjustment involving enhancing the pixel value of said pixel of interest when said added variance is significantly larger than a variance of noise, otherwise maintaining the pixel value of said pixel of interest; and

performing maximum intensity projection on the multi-slice images subjected to said pixel value adjustment.

9.   The image processing method according to any one of claims 6 — 8, wherein said enhancement of the pixel value is performed by multiplying by a coefficient equal to or greater one.

10.   The image processing method according to any one of claims 6 — 8, wherein said enhancement of the pixel value is performed by adding a predefined numeric value.

11.   The image processing method according to any one of claims 1 — 3 and 6 — 8, further comprising the step of: determining a residual sum of squares of pixel values for each of a plurality of local regions defined over the entire image; determining a histogram of said residual sums of squares; and then determining said variance of noise based on a residual sum of squares that gives a peak of said histogram.

12.   The image processing method according to any one of claims 1 — 3 and 6 — 8, wherein said image is a blood flow image.

13.   An image processing apparatus comprising:

a variance calculating device for, with each pixel constituting an image defined as a pixel of interest, determining a variance of pixel values in a local region to which said pixel of interest belongs; and

a pixel value adjusting device for maintaining the pixel value of said pixel of interest when said determined variance is significantly larger than a variance of noise, otherwise suppressing the pixel value of said pixel of interest.

14.　An image processing apparatus comprising:

a variance calculating device for, with each pixel constituting multi-slice images defined as a pixel of interest, determining a variance of pixel values in a local region to which said pixel of interest belongs;

a pixel value adjusting device for maintaining the pixel value of said pixel of interest when said determined variance is significantly larger than a variance of noise, otherwise suppressing the pixel value of said pixel of interest; and

a maximum intensity projecting device for performing maximum intensity projection on the multi-slice images subjected to said pixel value adjustment.

15.　An image processing apparatus comprising:

a variance calculating device for, with each pixel constituting multi-slice images defined as a pixel of interest, determining a variance of pixel values in a local region to which said pixel of interest belongs;

an adding device for adding to said determined variance a variance of pixel values in a local region to which a corresponding pixel of interest in an image of a neighboring slice belongs;

a pixel value adjusting device for maintaining the pixel value of said pixel of interest when said added variance is significantly larger than a variance of noise, otherwise suppressing the pixel value of said pixel of interest; and

a maximum intensity projecting device for performing maximum intensity projection on the multi-slice images subjected to said pixel value adjustment.

16.　The image processing apparatus according to any one of claims 13 — 15, wherein said pixel value adjusting device performs said suppression of the pixel value by multiplying by a coefficient less than one.

17.　The image processing apparatus according to any one of claims 13 — 15, wherein said pixel value adjusting device performs said

suppression of the pixel value by subtracting a predefined numeric value.

18.   An image processing apparatus comprising:

a variance calculating device for, with each pixel constituting an image defined as a pixel of interest, determining a variance of pixel values in a local region to which said pixel of interest belongs; and

a pixel value adjusting device for enhancing the pixel value of said pixel of interest when said determined variance is significantly larger than a variance of noise, otherwise maintaining the pixel value of said pixel of interest.

19.   An image processing apparatus comprising:

a variance calculating device for, with each pixel constituting multi-slice images defined as a pixel of interest, determining a variance of pixel values in a local region to which said pixel of interest belongs;

a pixel value adjusting device for enhancing the pixel value of said pixel of interest when said determined variance is significantly larger than a variance of noise, otherwise maintaining the pixel value of said pixel of interest; and

a maximum intensity projecting device for performing maximum intensity projection on the multi-slice images subjected to said pixel value adjustment.

20.   An image processing apparatus comprising:

a variance calculating device for, with each pixel constituting multi-slice images defined as a pixel of interest, determining a variance of pixel values in a local region to which said pixel of interest belongs;

an adding device for adding to said determined variance a variance of pixel values in a local region to which a corresponding pixel of interest in an image of a neighboring slice belongs;

a pixel value adjusting device for enhancing the pixel value of said pixel of interest when said added variance is significantly larger than a variance of noise, otherwise maintaining the pixel value of said pixel of interest; and

a maximum intensity projecting device for performing maximum intensity projection on the multi-slice images subjected to said pixel value adjustment.

5

21. The image processing apparatus according to any one of claims 18 — 20, wherein said pixel value adjusting device performs said enhancement of the pixel value by multiplying by a coefficient equal to or greater one.

10

22. The image processing apparatus according to any one of claims 18 — 20, wherein said pixel value adjusting device performs said enhancement of the pixel value by adding a predefined numeric value.

23. The image processing apparatus according to any one of claims
15 13 — 15 and 18 — 20, further comprising:

as a device for determining said variance of noise, a noise variance calculating device for determining a residual sum of squares of pixel values for each of a plurality of local regions defined over the entire image; determining a histogram of said residual sums of squares; and then
20 determining said variance of noise based on a residual sum of squares that gives a peak of said histogram.

24. The image processing apparatus according to any one of claims 13 — 15 and 18 — 20, wherein said image is a blood flow image.

25

25. A recording medium for being recorded in a computer-readable manner with a program for causing a computer to implement the functions of:

with each pixel constituting an image defined as a pixel of interest,
30 determining a variance of pixel values in a local region to which said pixel of interest belongs; and

maintaining the pixel value of said pixel of interest when said determined variance is significantly larger than a variance of noise, otherwise suppressing the pixel value of said pixel of interest.

26.   A recording medium for being recorded in a computer-readable manner with a program for causing a computer to implement the functions of:

5   with each pixel constituting multi-slice images defined as a pixel of interest, determining a variance of pixel values in a local region to which said pixel of interest belongs;

performing pixel value adjustment involving maintaining the pixel value of said pixel of interest when said determined variance is significantly 10 larger than a variance of noise, otherwise suppressing the pixel value of said pixel of interest; and

performing maximum intensity projection on the multi-slice images subjected to said pixel value adjustment.

15   27.   A recording medium for being recorded in a computer-readable manner with a program for causing a computer to implement the functions of:

with each pixel constituting multi-slice images defined as a pixel of interest, determining a variance of pixel values in a local region to which 20 said pixel of interest belongs;

adding to said determined variance a variance of pixel values in a local region to which a corresponding pixel of interest in an image of a neighboring slice belongs;

performing pixel value adjustment involving maintaining the pixel 25 value of said pixel of interest when said added variance is significantly larger than a variance of noise, otherwise suppressing the pixel value of said pixel of interest; and

performing maximum intensity projection on the multi-slice images subjected to said pixel value adjustment.

30

28.   A recording medium for being recorded in a computer-readable manner with a program for causing a computer to implement the functions of:

with each pixel constituting an image defined as a pixel of interest,

determining a variance of pixel values in a local region to which said pixel of interest belongs; and

enhancing the pixel value of said pixel of interest when said determined variance is significantly larger than a variance of noise, otherwise maintaining the pixel value of said pixel of interest.

5

29.   A recording medium for being recorded in a computer-readable manner with a program for causing a computer to implement the functions of:

10

with each pixel constituting multi-slice images defined as a pixel of interest, determining a variance of pixel values in a local region to which said pixel of interest belongs;

performing pixel value adjustment involving enhancing the pixel value of said pixel of interest when said determined variance is significantly larger than a variance of noise, otherwise maintaining the pixel value of said pixel of interest; and

15

performing maximum intensity projection on the multi-slice images subjected to said pixel value adjustment.

20

30.   A recording medium for being recorded in a computer-readable manner with a program for causing a computer to implement the functions of:

with each pixel constituting multi-slice images defined as a pixel of interest, determining a variance of pixel values in a local region to which said pixel of interest belongs;

25

adding to said determined variance a variance of pixel values in a local region to which a corresponding pixel of interest in an image of a neighboring slice belongs;

performing pixel value adjustment involving enhancing the pixel value of said pixel of interest when said added variance is significantly larger than a variance of noise, otherwise maintaining the pixel value of said pixel of interest; and

30

performing maximum intensity projection on the multi-slice images subjected to said pixel value adjustment.

31. An imaging apparatus for producing an image based on signals collected from an object, comprising:

a variance calculating device for, with each pixel constituting an image defined as a pixel of interest, determining a variance of pixel values in a local region to which said pixel of interest belongs; and

a pixel value adjusting device for maintaining the pixel value of said pixel of interest when said determined variance is significantly larger than a variance of noise, otherwise suppressing the pixel value of said pixel of interest.

32. An imaging apparatus for producing an image based on signals collected from an object, comprising:

a variance calculating device for, with each pixel constituting multi-slice images defined as a pixel of interest, determining a variance of pixel values in a local region to which said pixel of interest belongs;

a pixel value adjusting device for maintaining the pixel value of said pixel of interest when said determined variance is significantly larger than a variance of noise, otherwise suppressing the pixel value of said pixel of interest; and

a maximum intensity projecting device for performing maximum intensity projection on the multi-slice images subjected to said pixel value adjustment.

33. An imaging apparatus for producing an image based on signals collected from an object, comprising:

a variance calculating device for, with each pixel constituting multi-slice images defined as a pixel of interest, determining a variance of pixel values in a local region to which said pixel of interest belongs;

an adding device for adding to said determined variance a variance of pixel values in a local region to which a corresponding pixel of interest in an image of a neighboring slice belongs;

a pixel value adjusting device for maintaining the pixel value of said pixel of interest when said added variance is significantly larger than a

variance of noise, otherwise suppressing the pixel value of said pixel of interest; and

a maximum intensity projecting device for performing maximum intensity projection on the multi-slice images subjected to said pixel value

5   adjustment.

34.   An imaging apparatus for producing an image based on signals collected from an object, comprising:

a variance calculating device for, with each pixel constituting an

10 image defined as a pixel of interest, determining a variance of pixel values in a local region to which said pixel of interest belongs; and

a pixel value adjusting device for enhancing the pixel value of said pixel of interest when said determined variance is significantly larger than a variance of noise, otherwise maintaining the pixel value of said pixel of

15 interest.

35.   An imaging apparatus for producing an image based on signals collected from an object, comprising:

a variance calculating device for, with each pixel constituting

20 multi-slice images defined as a pixel of interest, determining a variance of pixel values in a local region to which said pixel of interest belongs;

a pixel value adjusting device for enhancing the pixel value of said pixel of interest when said determined variance is significantly larger than a variance of noise, otherwise maintaining the pixel value of said pixel of

25 interest; and

a maximum intensity projecting device for performing maximum intensity projection on the multi-slice images subjected to said pixel value adjustment.

30   36.   An imaging apparatus for producing an image based on signals collected from an object, comprising:

a variance calculating device for, with each pixel constituting multi-slice images defined as a pixel of interest, determining a variance of pixel values in a local region to which said pixel of interest belongs;

an adding device for adding to said determined variance a variance of pixel values in a local region to which a corresponding pixel of interest in an image of a neighboring slice belongs;

5   a pixel value adjusting device for enhancing the pixel value of said pixel of interest when said added variance is significantly larger than a variance of noise, otherwise maintaining the pixel value of said pixel of interest; and

a maximum intensity projecting device for performing maximum intensity projection on the multi-slice images subjected to said pixel value

10   adjustment.